

WHAT IS CLAIMED IS:

1. A scan type exposure apparatus, comprising:
- a first movable stage on which a first object is to be placed;
 - 5 a second movable stage on which a second object is to be placed;
 - a projection optical system for projecting a pattern of the first object on to the second object;
 - a scanning mechanism for scanningly moving
 - 10 said first and second movable stages in a timed relation with each other, relatively to said projection optical system, while the pattern of the first object is projected by said projection optical system on to the second object;
 - 15 storing means for storing therein a data corresponding to a change in exposure condition as measured beforehand and to be produced by moving at least one of said first and second movable stages; and
 - control means for controlling drive of said
 - 20 first and second movable stages in an actual exposure process, while reflecting a correction value, as determined on the basis of the data stored, to the drive of at least one of said first and second movable stages.
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2. An apparatus according to Claim 1, wherein the correction value is determined with respect to

plural accelerations or speeds of at least one of said
first and second movable stages, and [wherein] the
correction value is set variably in accordance with
the accelerations or speeds and with directions of
5 them.

3. An apparatus according to Claim 1, wherein
the correction value is determined with respect to a
deviation of a projected image of the pattern of the
10 first object, upon the second object.

4. An apparatus according to Claim 1, wherein
the correction value is determined with respect to a
focus error of a projected image of the pattern of the
15 first object, upon the second object.

5. An apparatus according to Claim 3, wherein
the scan exposure is performed while controlling a
quantity of exposure light in accordance with a speed
20 of at least one of said first and second movable
stages.

6. A scanning exposure method wherein a first
movable stage on which a first object is placed and a
25 second movable stage on which a second object is
placed are scanningly moved in a timed relation with
each other, relatively to a projection optical system,

while a pattern of the first object is projected through the projection optical system on to the second object, said method comprising the steps of:

storing a data corresponding to a change in exposure condition as measured beforehand and to be produced by moving at least one of the first and second movable stages; and

performing scan exposure while reflecting a correction value, as determined on the basis of the data stored, to the drive of at least one of the first and second movable stages.

7. A device manufacturing method wherein a first movable stage on which a first object is placed and a second movable stage on which a semiconductor wafer is placed are scaningly moved in a timed relation with each other, relatively to a projection optical system, while a pattern of the first object is projected through the projection optical system on to the wafer, said method comprising the steps of:

storing a data corresponding to a change in exposure condition as measured beforehand and to be produced by moving at least one of the first and second movable stages; and

performing scan exposure while reflecting a correction value, as determined on the basis of the data stored, to the drive of at least one of the first

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and second movable stages.

8. A method according to Claim 7, wherein the correction value is determined with respect to plural
5 accelerations or speeds of the first and second movable stages, and wherein the correction value is set variably in accordance with the accelerations or speeds and with directions of them.

10 9. A method according to Claim 7, wherein the correction value is determined with respect to deviation of a projected image of the pattern of the first object, upon the second object.

15 10. A method according to Claim 7, wherein the correction value is determined with respect to a focus error of a projected image of the pattern of the first object, upon the second object.

20 11. A method according to Claim 9, wherein the scan exposure is performed while controlling a quantity of exposure light in accordance with a speed of at least one of the first and second movable stages.

25 12. A scan type projection exposure apparatus, comprising:

a first movable stage on which a first object is to be placed;

a second movable stage on which a second object is to be placed;

5 a projection optical system;

scanning means cooperable with said projection optical system, for scanningly moving said first and second movable stages in a timed relation with each other and at a speed ratio
10 corresponding to a projection magnification of said projection optical system so that a pattern of the first object is projected by said projection optical system on to the second object;

detecting means for measuring a position of
15 an image plane of the first object defined by said projection optical system;

storing means for storing therein image plane positions as measured by said detecting means while scanningly moving said first movable stage, as
20 correction values related to image plane positions at different scan positions of said first movable stage];
and

driving means for moving the second object in a direction of focus on the basis of the image plane
25 positions stored in said storing means, to set the second object with respect to the image plane position.

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13. An apparatus according to Claim 12, wherein,
before image plane position measurement during
scanning motion of said first movable stage, said
5 detecting means detects image plane position
information of the first object defined by said
projection optical system as said first movable stage
is held fixed, on the basis of which image plane
position information said detecting means calculates
10 information related to image plane positions with
respect to different scan positions of said first
movable stage.

14. An apparatus according to Claim 12, wherein
15 said detecting means includes an illumination light
source for projecting illumination light on to the
first object, a first slit for passing a portion of
the illumination light and provided to the surface of
the first object, and light receiving means for
20 detecting light, of the illumination light, passed
through said first slit and through said projection
optical system, and wherein said detecting means
detects information related to image plane positions
of the first object with respect to different scan
25 positions of said first movable stage, as defined by
said projection optical system, on the basis of a
signal produced by said light receiving means.

15. An apparatus according to Claim 12, wherein
said detecting means includes an illumination light
source for illuminating a second slit mark provided on
5 said second movable stage, and light receiving means
for detecting light coming from said second slit mark
and through said projection optical system, and
wherein said detecting means detects information
related to image plane positions of the first object
10 with respect to different scan positions of said first
movable stage, as defined by said projection optical
system, on the basis of a signal produced by said
light receiving means.

15 16. An apparatus according to Claim 14, wherein
said light receiving means detects light passed
through said first slit and through said projection
optical system and then reflected by a reflection
surface, provided on said second movable stage and
20 having a surface step structure, and then again passed
through said projection optical system and through
said first slit.

25 17. An apparatus according to Claim 12, wherein
the first object is formed with a first pattern for
image plane position measurement and an observation
window for observation of a surface of said second

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movable stage, wherein said second movable stage is
formed with a second pattern for image plane position
measurement, wherein said detecting means includes an
observation system for simultaneous observation of
5 said first and second patterns, such that said
detecting means detects information related to image
plane positions of the first object with respect to
different scan positions of said first movable stage,
as defined by said projection optical system, on the
10 basis of said first and second patterns observed by
said observation system.

18. A device manufacturing method, including
aligning a reticle and a wafer and then projecting and
15 printing a pattern of the reticle on to the wafer by
using a scan type projection exposure apparatus as
recited in any one of Claims 12 - 17, and then
developing the exposed wafer.

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